For OPERATING PERMIT 070PGA293

Bill Barrett Corporation – Mamm Creek Compressor Station
Garfield County
Source ID 0450186

Prepared by Bailey Smith March - April 2011

I. Purpose

This document establishes the basis for decisions made regarding the Applicable Requirements, Emission Factors, Monitoring Plan and Compliance Status of Emission Units covered within the Operating Permit proposed for the Mamm Creek Compressor Station. It is designed for reference during review of the proposed permit by the EPA, the Public and other interested parties.

Conclusions made in this report are based on information provided by the applicant in the Title V permit application submitted on June 4, 2007, additional information submitted on May 5, 2009 and May 14, 2009, various e-mail correspondences with the source and review of Division files. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Source

The Mamm Creek Compressor Station is a natural gas compression facility as defined under Standard Industrial Classification 1311. The facility gathers gas from surrounding well sites via a gathering pipeline system. The gas undergoes a natural separation process in the inlet separator that separates the gas from the liquids. The liquids go to the on-site storage tanks. The gas then goes to the compression stage where it is compressed from field pressure to approximately 1000psi. The compressed gas then goes through the TEG dehydration units to remove water to meet pipeline specifications. The dehydrated gas is then routed to the sales gas pipeline.

The eleven (11) Waukesha engines are rated at 1680 hp each and are four-cycle, rich burn, natural gas-fired, reciprocating internal combustion engines, equipped with non-selective catalytic reduction (NSCR) units and air-to-fuel ratio controllers to control emissions. The four Natco glycol dehydration units are equipped with flash tank, gas

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glycol pump, natural gas-fired reboiler and associated still-vent. There are four BTEX units (condensers) on a common header shared by the four dehydration units. Flash tanks streams are routed to either the fuel gas line to the reboiler or to the tanks. Six 400-bbl fixed roof tanks (currently, only 5 are installed) are used for storage of condensate prior to custody transfer. The tanks vapors and condensed still vent vapors are routed back to the inlet with the VRU or combusted in the flare as a backup to the VRU.

The facility is located approximately 4 miles southwest of Silt in Garfield County on County Road 3333. The area in which the plant operates is designated as attainment for all criteria pollutants. There are no affected states within 50 miles of the plant. The following Federal Class I designated area is within 100 kilometers of the plant: Black Canyon of the Gunnison National Park, West Elk Wilderness Area, Flattops Wilderness Area, Maroon Bells – Snowmass Wilderness Area, Colorado National Monument, and the Gunnison Gorge Recreation Area. Colorado National Monument and the Gunnison Gorge Recreation Area are not Federal Class I Areas, but have been designated by the State to have the same sulfur dioxide increment as a Federal Class I area.

Based on the information provided by the applicant, this facility is categorized as a synthetic minor stationary source (no single criteria pollutant emissions with a Potential to Emit of greater than 250 TPY) at the issuance date of this permit. The source therefore is not subject to the Prevention of Significant Deterioration (PSD) review requirements of 40 CFR 52.21 (Colorado Regulation 3, Part D, Section VI).

The potential to emit for the facility is listed in the table below. Note that insignificant activity is only counted for CO since it is the only pollutant for which the source is within 10% of the PSD threshold.

Emission Unit	Potential to Emit			
Emission onit	NO _X	VOC	CO	
ENG 1 – 4 (Total)	48.8	13.2	64.8	
ENG 5 – 11 (Total)	170.1	23.1	170.1	
TEG 1 – 4 (Total)		38.0		
TANKS		20.4		
FUG 1		29.1		
FLR 1	4.9		9.8	
Loadout		2.9		
Insignificant Activity			2.3	
Total	223.8	126.7	247.0	

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The breakdown of HAP emissions for each emission unit based on information provided in the Title V application is as follows:

	Emissions (tons/yr)		
Pollutant	ENG 1-11	TEG 1-4	Total
formaldehyde	2.14		2.14
benzene	0.50	3.25	3.75
n-hexane		0.93	0.93
toluene		4.36	4.36
Total HAPS	2.64	8.54	11.18

Compliance Assurance Monitoring (CAM)

Uncontrolled NO_X and CO emissions from each of the Waukesha 7044 GSIE engines are above the major source level and uncontrolled VOC emissions from each of the Natco glycol dehydration units are above the major source level. The control devices on the engines and dehydrators are used to meet their NO_X , CO and VOC emission limitations, therefore CAM applies to these units. However, since controlled emissions from the engines and dehydrators are below the major source level, CAM does not apply until the renewal of this permit (40 CFR Part 64 §64.5(b)).

NESHAP Subpart HH

The final rule for 40 CFR Part 63 Subpart HH was revised on January 3, 2007 to address sources that were minor for HAPs. An affected source under this subpart includes each triethylene glycol (TEG) dehydration unit located at a facility that processes hydrocarbon liquids. Mamm Creek has four TEG dehydrators that are subject to the provisions of Subpart HH.

Greenhouse Gases

In 2009 and 2010, EPA issued two rules related to Greenhouse Gasses (GHG) that may affect this facility.

On October 30, 2009, EPA published a rule for the mandatory annual reporting of GHG emissions to EPA from large GHG emissions sources in 40 CFR part 98. The facility may be required to identify GHG emissions in future Title V permit applications. Such identification may be satisfied by including some or all of the information reported to EPA to meet the GHG reporting requirements.

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III. Emission Sources

Initial approval of modification -1 of construction permit 06GA0062 was issued for the facility on May 9, 2008. According to the Title V permit application and submitted APENs, the units covered commenced operation on the following dates:

Emission Unit	Startup date
ENG 1 & 2	6/15/2005
ENG 3	10/10/2005
ENG 4	2/28/2006
ENG 5	6/15/2006
ENG 6	6/17/2006
ENG 7 & 8	2/14/2007
ENG 9	11/13/2007 (Manufactured 4/23/2007)
ENG 10	9/27/2007 (Manufactured 4/23/2007)
ENG 11	8/2007 (Manufactured 4/23/2007)
TEG 1	7/24/2005
TEG 2	10/10/2005
TEG 3	6/23/2006
TEG 4	3/2007
TANKS	9/1/2004
FUG 1	Facility purchased in 6/15/2005
FLARE	3/5/2005
Loadout	Unknown, existing at purchase

According to the Division's database, self-certifications for these units were received on October 21, 2008. Therefore, under the provisions of Colorado Regulation No. 3, Part C, Section V.A.3, the Division will not issue a final approval construction permit and is allowing the initial approval construction permit to continue in full force and effect.

ENG 1-4: Four (4) Waukesha 7044 GSIE, 4-Cycle Rich Burn, Spark Ignition, Air-To-Fuel Ratio Controlled, Natural Gas Fired Internal Combustion Engines, 1680 HP and 13.07 MMBtu/hr. Each Engine Drives a Compressor.

Applicable Requirements: The appropriate applicable requirements from the initial approval construction permit 06GA0062 have been incorporated into the permit as follows. The specific requirements are intended to apply to each engine.

 Visible emissions shall not exceed twenty percent (20%) opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (Condition 1).

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Note that Colorado Regulation No. 1 does not identify the 20% opacity requirement as a condition that only applies during normal operation. In addition, there are more specific activities under which the 30% opacity requirement applies than identified in the construction permit. All specific activities under which the 30% opacity standard applies are: building a new fire, cleaning of fire boxes, soot blowing, startup, any process modification, or adjustment or occasional cleaning of control equipment. Based on engineering judgment the Division considers that building a new fire, cleaning of fire boxes and soot-blowing does not apply to the operation of an internal combustion engine. Although this engine has a control device, it does not control PM emissions and therefore would not affect opacity emissions. Process modifications may apply to this engine; however, based on engineering judgment, the Division believes that such activities would be unlikely to occur for longer than six minutes. Therefore, the 30% opacity requirement has been included in the operating permit only for startup of this unit.

 Emissions from each engine shall be limited to the following: (Condition 4 and Appendix A of construction permit)

0	NO_X	12.2 tons/yr	and	2,072.3 lbs/mo
0	VOC	3.2 tons/yr	and	550.4 lbs/mo
0	CO	16.2 tons/vr	and	2,751.8 lbs/mo

The monthly limits apply for the first twelve months of operation. Since these engines have been operating for more than twelve months the monthly limitations have not been included in the operating permit.

• **Each engine** shall be limited to the following fuel consumption limits: (Condition 5)

Natural gas
 114.5 MMscf/yr and
 9.7 MMscf/mo

The monthly limits apply for the first twelve months of operation. Since these engines have been operating for more than twelve months the monthly limitations have not been included in the permit.

Facility wide emissions shall be limited to the following: (Condition 4)

Other single HAP < 8 tons/yrTotal HAPS < 20 tons/yr

Since these are facility wide requirement, this condition has been included in both the engines condition and the facility wide condition of the operating permit. The individual and total HAPs which are above the de minimums reporting level are to be summed with other equipment at the facility to monitor compliance with the facility-wide annual limitations.

• Stack heights shall be a minimum of 25 feet (Condition 6). This requirement is based on modeling data and has been included in the permit.

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 The engines shall be equipped with non-selective catalytic reduction (NSCR) capable of reducing uncontrolled emissions as specified below: (Condition 10)

Pollutant	Control Efficiency (%)	
NO _X	94.3	
CO	91.5	
Formaldehyde	76	
Other HAPs	50	

The emission limitations included in the permit incorporate these control efficiency requirements on the engines. Portable monitoring is required to confirm compliance with these limitations; therefore the requirement for these efficiencies was not specifically included in the operating permit.

 MACT Subpart ZZZZ applies at any time that the source becomes major for HAPS by virtue of relaxation of any permit condition. (Condition 15)

This condition was not included in the permit as it is not an applicable requirement. Regardless of whether the conditions in this construction permit are relaxed, once the facility exceeds the major source threshold for HAPs, major source MACT requirements apply. In addition, although this facility is not a major source for HAPs, MACT Subpart ZZZZ applies to both major and area sources of HAPs. Therefore, the appropriate applicable MACT requirements for area sources will be included in the permit.

MACT Subpart ZZZZ

Each of these four (ENG 1 - 4) existing four stroke rich burn spark ignition natural gas-fired reciprocating internal combustion engines are subject to the requirements set forth in 40 CFR Part 63 Subpart ZZZZ. These requirements include either reducing formaldehyde emission by 76% **or** limiting the concentration of formaldehyde in the stationary RICE exhaust to 2.7 ppmvd at 15 percent O_2 . The applicable requirements from Subpart ZZZZ will be included in the permit.

- The applicable requirements in NESHAP Subpart A General Provisions were included in the permit.
- While not specifically stated in the construction permit, these engines are subject to the requirement of Colorado Regulation No. 7, Section XVII.E. Reg 7 Section XVII.B.4 exempts units that are subject to MACT control requirements from the requirements of Section XVII.E. However, these MACT requirements have a compliance date of October 13, 2013. Until the source is in compliance with the more stringent MACT requirements, the engines must comply with the requirements of Reg 7 Section XVII.E. Both requirements were included in the operating permit.

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Emission Factors: Controlled emission factors, in g/hp-hr, from the catalyst manufacturer were provided in the Title V permit application. The emission factors have been converted to lbs/MMBtu using the following equation and the maximum heat rate of the engine (7,780 Btu/hp-hr).

$$EF (lbs/MMBtu) = \underbrace{EF (g/hp-hr) \times 10^6 Btu/MMBtu}_{Heat Rate (Btu/hp-hr) \times 453.6 g/lb}$$

Pollutant	Controlled Emission Factors (g/hp-hr)	Converted Emission Factors (lb/MMBtu)
NO _X	0.75 g/hp-hr	0.213
CO	1.0 g/hp-hr	0.283
VOC	0.2 g/hp-hr	0.057

Monitoring Plan: In order to monitor compliance with the annual emission and fuel consumption limits, the source is required to monitor fuel consumption and calculate emissions on a monthly basis.

Subpart ZZZZ requires the source to have continuous parameter monitoring system for the engines and site-specific monitoring plan. Until the applicability date of these requirements, the source must record the pressure drop across the catalysts monthly and monitor catalyst inlet temperature daily. There are also requirements for quarterly portable monitoring to verify compliance with the annual NO_X and CO emission limitations.

In the absence of credible evidence to the contrary, compliance with the Reg 1 opacity, limits shall be presumed since only natural gas is permitted to be used as fuel.

Compliance Status: In their Title V permit application, the source indicated that these engines were in compliance with all applicable requirements

ENG 5-11: Seven (7) Waukesha 7044 GSIE, 4-Cycle Rich Burn, Spark Ignition, Air-To-Fuel Ratio Controlled, Natural Gas Fired Internal Combustion Engines, 1680 HP and 13.07 MMBtu/hr. Each Engine Drives a Compressor.

Applicable Requirements: The appropriate applicable requirements from the initial approval construction permit 06GA0062 have been incorporated into the permit as follows. The specific requirements are intended to apply to each engine.

 Visible emissions shall not exceed twenty percent (20%) opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (Condition 1).

As explained above for the other engines, the 30% opacity requirement has been included in the operating permit only for startup of this unit.

• Emissions from **each engine** shall be limited to the following (Condition 4 and Appendix A of construction permit):

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0	NO_X	24.3 tons/yr	and	4,127.7 lbs/mo
0	VOC	3.2 tons/yr	and	550.4 lbs/mo
0	CO	24.3 tons/yr	and	4,127.7 lbs/mo

The monthly limits apply for the first twelve months of operation. Since these engines have been operating for more than twelve months the monthly limitations have not been included in the operating permit.

• **Each engine** shall be limited to the following fuel consumption limits (Condition 5):

Natural gas
 114.5 MMscf/yr and
 9.7 MMscf/mo

The monthly limits apply for the first twelve months of operation. Since these engines have been operating for more than twelve months the monthly limitations have not been included in the permit.

Facility wide emissions shall be limited to the following (Condition 4):

Other single HAP < 8 tons/yr

Total HAPS< 20 tons/yr

Since these are facility wide requirement, this condition has been included in both the engines condition and the facility wide condition of the operating permit. The individual and total HAPs which are above the de minimus reporting levels are to be summed with other equipment at the facility to monitor compliance with the facility-wide annual limitations.

- Stack heights shall be a minimum of 25 feet (Condition 6). This requirement has been included in the permit.
- Performance tests shall be conducted on engine 9, 10 and 11 to measure NO_X, CO and formaldehyde emissions (Condition 7)

Performance tests were conducted December 11-13, 2007 and March 5, 2008 for the engines. Therefore this requirement was not included in the operating permit.

• The engines shall be equipped with non-selective catalytic reduction (NSCR) capable of reducing uncontrolled emissions as specified below: (Condition 10)

Pollutant	Control Efficiency (%)	
NO _X	88.5	
CO	87.2	
Formaldehyde	76	
Other HAPs	50	

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The emission limitations included in the permit incorporate these control efficiency requirements. Portable monitoring is required to confirm compliance with these limitations; therefore the requirement for these efficiencies was not specifically included in the operating permit.

- Reg 7 Section XVII requirements apply to these engines because they are not subject to any MACT control requirements (Colorado Regulation No. 7 Section XVII.B.4). The requirement to install appropriate control technology was included in the operating permit.
- Manufacturer, model and serial number of engine 9, 10 and 11 shall be provided prior to final approval (Condition 19)

The self-certification submitted on October 21, 2008 supplied this information; therefore, this requirement was not included in the permit.

 MACT Subpart ZZZZ applies at any time that the source becomes major for HAPS by virtue of relaxation of any permit condition (Condition 15)

This condition will not be included in the permit as it is not an applicable requirement. Regardless of whether the conditions in this construction permit are relaxed, once the facility exceeds the major source threshold for HAPs, major source MACT requirements apply. In addition, although this facility is not a major source for HAPs, MACT Subpart ZZZZ applies to both major and area sources of HAPs. Therefore, the appropriate applicable MACT requirements for area sources have been included in the permit.

40 CFR Part 63 Subpart ZZZZ

The construction permits did not include specific MACT Subpart ZZZZ requirements for area sources. MACT Subpart ZZZZ applies to all size new or reconstructed engines (commenced construction or reconstruction after June 12, 2006) located at area sources. The definition of "construction" is in 40 CFR Part 63 Subpart A § 63.2 and is based on "on-site" fabrication. The "on-site" construction for engines 5 -11 commenced after June 12, 2006. Therefore, these engines are considered "new" and are subject to the RICE MACT requirements. As specified in § 63.6590(c), new or reconstructed RICE located at area sources must meet the requirements of Subpart ZZZZ by meeting the requirements in 40 CFR Part 60 Subpart JJJJ and no further requirements apply under 40 CFR Part 63 Subpart ZZZZ.

NSPS Subpart JJJJ applies to owners or operators of engines that commenced construction after June 12, 2006 <u>and</u> were manufactured after July 1, 2007 for engines > 500 hp. The latest manufacture date for engines 5-11 was 4/23/2007. Therefore, the NSPS Subpart JJJJ requirements do not apply.

Therefore, since the engines are "new", the requirements of MACT Subpart ZZZZ are met by meeting the requirements in NSPS Subpart JJJJ. Although these

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engines are not subject to any NSPS Subpart JJJJ requirements, no further requirements apply under MACT Subpart ZZZZ

 NESHAP Subpart A – General Provisions do not apply to these engines since NESHAP Subpart ZZZZ specifies that "no further requirements apply" to new engines at area sources other than NSPS JJJJ. (§63.6590(c)).

Emission Factors: Controlled emission factors, in g/hp-hr, from the catalyst manufacturer were provided in the Title V permit application. The emission factors have been converted to lbs/MMBtu using the following equation and the maximum heat rate of the engine (7,780 Btu/hp-hr).

$$EF (lbs/MMBtu) = \underbrace{EF (g/hp-hr) \times 10^6 Btu/MMBtu}_{Heat Rate (Btu/hp-hr) \times 453.6 g/lb}$$

Pollutant	Controlled Emission Factors (g/hp-hr)	Converted Emission Factors (lb/MMBtu)
NO _X	1.5 g/hp-hr	0.425
CO	1.5 g/hp-hr	0.425
VOC	0.2 g/hp-hr	0.057

Monitoring Plan: In order to monitor compliance with the annual emission and fuel consumption limits, the source is required to monitor fuel consumption and calculate emissions on a monthly basis.

The source is also required to record the pressure drop across the catalysts monthly and monitor catalyst inlet temperature daily. The monitoring grid also requires quarterly portable monitoring to verify the percent reduction of CO emissions and quarterly portable monitoring to measure outlet NO_X and CO emissions. The quarterly portable monitoring is required in order to verify compliance with the annual NO_X and CO emission limitations.

In the absence of credible evidence to the contrary, compliance with the Reg 1 opacity, limits shall be presumed since only natural gas is permitted to be used as fuel.

Compliance Status: In their Title V permit application, the source indicated that these engines were in compliance with all applicable requirements

TEG 1-4: Four (4) Dehydrators

Applicable Requirements: The appropriate applicable requirements from the initial approval construction permit 06GA0062 have been incorporated into the permit as follows. The specific requirements are intended to apply to each dehydrator.

 Visible Emissions shall not exceed 20 % opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (Condition 1 and Regulation No. 1, Section II.A.1. & 4).

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The 20% / 30 % opacity requirement applies to the glycol dehydrator (the flare is subject to a different Reg 1 opacity requirement as mentioned below). However, the dehydrator exhaust consists solely of VOC emissions. Typically the Division does not include the opacity limit in permits for VOC sources, therefore, the 20% / 30% opacity limit has not been included under this specific section of the permit.

- Emissions of air pollutant from each dehydrator shall not exceed the following limitations (Condition 4):
 - o VOC 9.5 tons/yr and 1,613.7 lbs/mo

The monthly limits apply for the first twelve months of operation. Since these dehydrators have been operating for more than twelve months the monthly limitations has not been included in the operating permit.

- **Each dehydrator** shall be limited to the following wet natural gas throughput limits (Condition 5):
 - Natural gas
 9,125 MMscf/yr and
 775 MMscf/mo

The monthly limits apply for the first twelve months of operation. Since these dehydrators have been operating for more than twelve months the monthly limitations has not been included in the permit.

- Facility wide emissions shall be limited to the following (Condition 4):
 - Other single HAP < 8 tons/yr
 - o Total HAPS < 20 tons/yr</p>

Since these are facility wide requirements this condition has been included under both the dehydrator conditions and the facility wide conditions of the operating permit. The individual and total HAPs which are above the de minimus reporting level are to be summed with other equipment at the facility to monitor compliance with the facility-wide annual limitations.

- The maximum pumping rate of lean glycol in **each dehydrator** shall not exceed 7.5 gallons per minute (a pump stroke correlation can be used) (Condition 4). This requirement was included in the operating permit.
- The dehydrators shall be equipped with control equipment capable of reducing VOC emissions by 95% (Condition 12). This requirement was included in the operating permit.
- [State-Only] Colorado Regulation No. 7 Section XVII requirements apply to these dehydrators because they are subject to only the management practices under MACT (Colorado Regulation No. 7 Section XVII.B.4). Section XVII requires that these TEGs be equipped with a control device to reduce emissions by 90%. This requirement is less stringent than the aforementioned 95% requirement and therefore has been streamlined and was included in the permit shield section of the operating permit.

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- The major source provisions of MACT Subpart HH requirements shall apply to this source at any such time that this source becomes major for HAPs by virtue of relaxation. (Condition 14)
 - This condition will not be included in the permit as it is not an applicable requirement. Regardless of whether the conditions in this construction permit are relaxed, once the facility exceeds the major source threshold for HAPs, major source MACT requirements apply. In addition, although this facility is not a major source for HAPs, MACT Subpart HH applies to both major and area sources of HAPs. Therefore, the appropriate applicable MACT requirements for area sources have been included in the permit.
- GRI GlyCALC 4.0 analysis shall be performed monthly to calculate emissions. Extended gas analysis shall be performed annually and made available to the Division for inspection upon request (Condition 23). This requirement was included in the permit under the emissions limitation Condition 3.1 and the gas analysis Condition 3.3.
- The following provisions from NESHAP Subpart HH were included in the construction permit:
 - Compliance date of January 5, 2009 (Condition 24.a). Since this deadline has passed, it was not included in the operating permit.
 - Facility is exempt from requirements provided emissions of benzene less are than 0.90 Mg/yr (1,984 lbs/yr) (Condition 24.b). This requirement was included in the operating permit.
 - Determination of actual average benzene emission using GRI-GLYCalc, Version 3.0 or higher (Condition 24.c). This requirement was included in the operating permit.
 - o Maintain records of actual benzene emissions annually (Condition 24.d). This requirement was included in the operating permit.

Emission Factors: Triethylene glycol is contacted with the natural gas stream to reduce the moisture in the natural gas to a desired level. This glycol-water mixture is heated in the still vent portion of the unit to remove the collected moisture from the glycol. VOCs and HAPs entrained in the water are also released. The emissions from this process is estimated using the Gas Research Institute's GLYCalc Model. The Model algorithm estimates the VOC and HAP emissions based on inputs of the glycol recirculation rate, cubic feet of gas processed, inlet temperature and pressure of the processed wet gas, and percentage breakdown by volume of constituents in the natural gas.

Monitoring Plan: The Division requires monthly monitoring of all parameters which are used in monthly GLYCalc modeling, with exception of glycol circulation rate and condenser outlet temperatures, which will be monitored daily. Samples of the inlet gas shall be collected and analyzed annually. The natural gas processing rate is recorded monthly. The hours/days of operation of the each TEG is also monitored.

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Compliance Status: In their Title V permit application, the source indicated that these dehydrators were in compliance with all applicable requirements.

TANKS: Condensate Tank Battery

Applicable Requirements: The appropriate applicable requirements from the initial approval construction permit 06GA0062 have been incorporated into the permit as follows. The specific requirements are intended to apply to the battery of six tanks collectively.

• Visible emissions shall not exceed twenty percent (20%) opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (Condition 1).

The tank battery emissions consists solely of VOC. Typically the Division does not include the opacity limit in permits for VOC sources, therefore, the 20% / 30% opacity limit has not been included under this specific section of the permit.

- Emissions of air pollutant from the tank battery shall not exceed the following limitations (Condition 4):
 - o VOC 20.4 tons/yr and 3,472 lbs/mo

The monthly limits apply for the first twelve months of operation. Since these tanks have been operating for more than twelve months the monthly limitations have not been included in the operating permit.

- The tank battery shall be limited to the following condensate throughput limits (Condition 5):
 - Condensate 54,750 barrels/yr and 4650 barrels/mo

The monthly limits apply for the first twelve months of operation. Since these tanks have been operating for more than twelve months the monthly limitations have not been included in the permit.

- Facility wide emissions shall be limited to the following (Condition 4):
 - Other single HAP < 8 tons/yr
 - Total HAPS< 20 tons/yr

Since these are facility wide requirements this condition was included under both the tank battery conditions and the facility wide conditions of the operating permit. The individual and total HAPs which are above the de minimus reporting levels are to be summed with other equipment at the facility to monitor compliance with the facility-wide annual limitations.

• The tank battery shall be equipped with control equipment capable of reducing VOC emissions by 95%. (Condition 12). This was included in permit Condition 4.5.

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- E&P TANKS analysis shall be performed monthly to calculate emissions. A new extended gas analysis shall be performed annually and made available to the Division for inspection upon request. (Condition 23) This requirement was included in the permit under the emissions limitation Condition 4.1 and the gas analysis Condition 4.2.3.
- While not specifically identified in the construction permit, the tank battery is subject to the provision of Colorado Regulation No. 7 Section XVII.C which specifies requirements for emissions reductions. These requirements were included in the operating permit.

Emission Factors: The emissions are estimated using API's E&P Tanks. Emissions are calculated on a monthly basis.

Monitoring Plan: The source is required to record the quantity of condensate processed and calculate emissions on a monthly basis. Some E&P Tanks input parameters are also monitored: the inlet separator temperature and pressure are monitored monthly, condensate sales are recorded monthly and API gravity is determined on a monthly basis.

Compliance Status: In their Title V permit application, the source indicated that the tank battery was in compliance with all applicable requirements.

FUG 1: Fugitive VOC Emissions from Equipment Leaks

Applicable Requirements: The appropriate applicable requirements from the initial approval construction permit 06GA0062 have been incorporated into the permit as follows.

 Visible Emissions shall not exceed 20 % opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (Condition 1 and Regulation No. 1, Section II.A.1. & 4).

The 20% / 30 % opacity requirement applies to the fugitive emissions. However, the fugitives consist solely of VOC emissions. Typically the Division does not include the opacity limit in permits for VOC sources; therefore, the 20% / 30% opacity limit was not included under this specific section of the permit.

• Emissions of air pollutant from equipment leaks shall not exceed the following limitations (Condition 4):

o VOC 29.0 tons/yr and 4,934.5 lbs/mo

The monthly limit applies for the first twelve months of operation. Since this facility has been operating for longer than twelve months the monthly limitation has not been included in the operating permit.

• The source shall be limited to the a maximum equipment configuration as listed below (Condition 4):

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Component	Component Count		
	Gas Service	Heavy Oil Service	Light Oil Service
Valves	620	20	460
Connectors	110		80
Flanges	1200		220
Open-Ended Lines	70		45
Other*	170		115
VOC Content (wt%)	18.0	100.0	13.0

This requirement has been included in the permit. Additional language was added specifying that the addition of components would be considered a relaxation of the permit terms and therefore would need to be reviewed as a modification.

- Facility wide emissions shall be limited to the following (Condition 4):
 - Other single HAP < 8 tons/yr
 - Total HAPS< 20 tons/yr

The HAP emissions due to equipment leaks would be negligible to the total facility HAP emission and therefore was not included in this specific section of the operating permit.

Emission Factors: Emissions from equipment leaks have been calculated based on emission factors from EPA's Protocol for Emission Leak Estimates (Table 2-6 (EPA 453/R-95-017)). Factors are multiplied by the number of components of each type (e.g. Compressor Seals) and the VOC weight percentage in the organic portion of the gas stream as determined in the most recent analysis. EPA factors are given in terms of Total Organic Compounds.

Monitoring Plan: Records shall be kept of the component count and a physical "hard count" shall be conducted every five years.

Compliance Status: In their Title V permit application, the source indicated that fugitive emissions were in compliance with all applicable requirements.

FLARE: Flare

Applicable Requirements: The appropriate applicable requirements from the initial approval construction permit 06GA0062 have been incorporated into the permit as follows.

 Visible emissions shall not exceed 30% opacity for a period or periods aggregating more than six minutes in any sixty consecutive minutes. (Colorado Regulation No. 1, II.A.5).

The 20% / 30 % opacity requirement was listed in the Construction Permit 06GA062, Condition 1. However, the flare is subject to the exception

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requirements listed in Reg 1 for smokeless flares. Therefore, the 30% opacity limit was included under this section of the permit.

• Emissions of air pollutant from the flare shall not exceed the following limitations (Condition 4):

NO_X
 4.9 tons/yr and 832.3 lbs/mo
 CO
 9.8 tons/yr and 1,664.6 lbs/mo

The monthly limits apply for the first twelve months of operation. Since the flare has been operating for more than twelve months the monthly limitations has not been included in the operating permit.

• The flare shall be limited to the following fuel consumption limits (Condition 5):

o Flare Fuel 105,705 MMBtu/yr and 8,977.7 MMBtu/mo

The monthly limits apply for the first twelve months of operation. Since this flare has been operating for more than twelve months the monthly limitations has not been included in the permit. Note that these limits are not solely based on volume of gases flared but a function of both heat content and volume of gas.

Facility wide emissions shall be limited to the following (Condition 4):

Other single HAP < 8 tons/yr

o Total HAPS < 20 tons/yr

The HAP emissions due to flared gases would be negligible to the total facility HAP emission and therefore was not included in this specific section of the operating permit.

- The flare shall be operated with the pilot flame present at all times. This
 requirement was not included in the construction permit, but is a necessary
 parameter for proper operation of the flare. This requirement was added to the
 operating permit.
- This flare is subject to the requirements of Reg 7, Section XVII.B.1.c which requires any flare used as control to be enclosed. This flare installed at this facility is enclosed and therefore this requirement was not included in the permit.

The condition for recording hours of operation also includes the requirement that the flare shall be operating at all time in which gases are routed to it.

Emission Factors: Per the recommendation of the Division, the source utilizes emission factors from the Texas National Resource Conservation Commission's Flare Guidance, October 2000 RG-109, page 20, Table 4 to calculate NO_X and VOC emission from the flare.

Monitoring Plan: In order to monitor compliance with the annual emission and fuel consumption limits, the source is required to monitor natural gas consumption and calculate emissions on a monthly basis. The fuel usage and heat content for the flare

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shall be determined from the modeling outputs for the tanks and the dehydrators. The presence of a pilot flame is monitored continuously using a thermocouple.

Compliance with opacity will be monitored by conducting a non-Method 9 visible emissions observation annually. In the event that visible emissions are noted, a Method 9 will be performed.

Compliance Status: In their Title V permit application, the source indicated that the flare was in compliance with all applicable requirements.

Loadout: Condensate Truck Loadout

Applicable Requirements: The appropriate applicable requirements from the initial approval construction permit 06GA0062 have been incorporated into the permit as follows:

 Visible Emissions shall not exceed 20 % opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (Condition 1 and Regulation No. 1, Section II.A.1. & 4).

The 20% / 30 % opacity requirement applies to the condensate loadout emissions. However, the loadout emissions consist solely of VOC emissions. Typically the Division does not include the opacity limit in permits for VOC sources; therefore, the 20% / 30% opacity limit was not included under this specific section of the permit.

• Emissions of air pollutant from the loadout shall not exceed the following limitations (Condition 4):

o VOC 2.9 tons/yr and 485.8 lbs/mo

The monthly limits apply for the first twelve months of operation. Since the loadout has been operating for more than twelve months the monthly limitations has not been included in the operating permit.

• The loadout shall be limited to the following condensate throughput limits (Condition 5):

o Condensate 2,300,000 gallons/yr and 195,300 gallons/mo

The monthly limits apply for the first twelve months of operation. Since this loadout has been operating for more than twelve months the monthly limitations has not been included in the permit.

Facility wide emissions shall be limited to the following (Condition 4):

Other single HAP < 8 tons/yr

Total HAPS< 20 tons/yr

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The HAP emissions due to condensate loadout would be negligible to the total facility HAP emission and therefore was not included in this specific section of the operating permit.

Emission Factors: Emissions have been calculated using equation (1) found in AP-42 5.2 – Transportation and Marketing of Petroleum Liquids. The resultant emission factor of 2.48 lb/1000 gallons loaded was listed in the Operating Permit.

Monitoring Plan: The permittee is required to calculate emissions on a 12-month rolling basis. Condensate throughput is recorded during each loading period. This throughput data is used for compliance with annual throughput limits as well as used in the calculation for the emissions limits.

Compliance Status: In their Title V permit application, the source indicated that the loadout was in compliance with all applicable requirements.

Facility Wide

Applicable Requirements: The appropriate applicable requirements from the initial approval construction permit 06GA0062 have been incorporated into the permit as follows:

- Odor requirements of Regulation No. 2 (Condition 2). This requirement is included in the general conditions section of the operating permit and to reduce redundancy throughout the permit, this requirement was not included in the specific conditions.
- Facility wide emission limitations for NO_X, VOC and CO (Condition 4). Since there are individual limits for each piece of equipment at this facility, these facility wide limitations were not explicitly listed in the operating permit
- Follow the most current operating and maintenance plan and record keeping format approved by the Division (Condition 11).

The requirement to follow the O&M plan has been omitted from the operating permit, however, the appropriate provisions from the latest O&M Plan has been included.

 PSD requirements shall apply to this source at any such time that this source becomes major solely by virtue of relaxation of any permit condition (Condition 13)

This condition was not included in the operating permit, since no actual requirements apply, unless certain modifications to the permit conditions for this facility are made. Although this requirement will not be included in the permit, future modifications that cause the Mamm Creek facility to become major, for purposes of PSD, by virtue of relaxation of any of these permit conditions in Construction Permit 06GA0062 will result in the application of PSD review. This specification was, however, included in Section I, Condition 3 with the PSD status information.

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- APEN reporting requirements (Condition 16). The APEN reporting requirements was not identified in the permit as a specific condition but are included in Section IV (General Conditions) Condition 22.e.
- Insignificant activity emissions shall not exceed 4.9 tons/yr of CO (Condition 17).

This requirement has been included in the facility-wide section of the permit with a slight modification to account for the summation of rounding errors. These emissions will be calculated annually to determine compliance with the emission limitations. For the purposes of this requirement, insignificant activity is defined as any activity or equipment that is not subject to APEN reporting requirements.

- Within 180 days after issuance of this permit, compliance with these conditions shall be demonstrated (Condition 19). A self-certification was submitted in October 21, 2008; therefore, this requirement has not been included in the permit.
- This permit will expire if construction does not commence within 18 months of permit issuance (Condition 21). All units covered under this construction permit have commenced operation; therefore, this requirement has not been included in the operating permit.
- This facility shall be completely enclosed by a fence and posted with no trespassing signs (Condition 22). This requirement has been included in this section of the operating permit.

IV. Insignificant Activities

Condition 17 of the construction permit limits insignificant activity to 5.2 tons per year of CO. This requirement was included under the facility-wide conditions of the operating permit. The source identified in the Title V permit application that the following general categories of insignificant activities and specific insignificant activities:

- Individual fuel burning equipment, other than smokehouse generators and internal combustion engines, which use gaseous fuel, and has a design rate less than or equal to 5 MMBtu/hr
 - o Five (5) 0.75 MMBtu/hr Heater
 - o One (1) 0.75 MMBtu/hr Heater (Not Installed)
 - o Four (4) Dehydrator Reboiler 0.75 MMBtu/hr Heater
- Pneumatic Devices
- Chemical storage tanks or containers that hold less than 500 gallons, and which have a daily throughput less than 25 gallons.
- Chemical storage areas where chemicals are stored in closed containers, and where total storage capacity does not exceed 5000 gallons.
- Oil production wastewater (produced water tanks), containing less than 1% by volume crude oil.
- Storage tanks of capacity < 40,000 gallons of lubricating oils

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- Crude oil or condensate storage tanks with a capacity of 40,000 gallons or less
- Fuel burning equipment which uses gaseous fuel, and which has a design rate less than or equal to 10 MMBtu/hr, and which is used solely for heating building for personal comfort
 - Several space heaters totaling 0.92 MMBtu/hr
- APEN exempt units

The permit application listed a small generator as insignificant activity which was subsequently removed.

V. Alternative Operating Scenarios

The construction permit for the engines included an alternative operating scenario (AOS) for both permanent and temporary engine replacement. Therefore, the AOS for engine replacement has been included in the operating permit with modified reporting deadlines. These deadlines have been changed upon request by the source to maintain consistency with other required reporting deadlines.

VI. Permit Shield

In their original Title V permit application, the source did not provide justification for any of the specific non-applicable requirements requested. The list also contained many citations that were clearly unnecessary for the shield. It is the Division's opinion that the Shield should be reserved for regulations that might reasonably otherwise apply to equipment at the plant in question. The source provided supplemental information via e-mail which included a list of key non-applicable requirements and corresponding justification. This supplemental list was included in the operating permit rather than the list identified in the application.

There were no streamlined conditions other than the Reg 7 dehydrator requirement for a 90% control efficiency as previously mentioned.

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